

ABSTRACT OF THE DISCLOSURE

One block SB serving as a fundamental unit constituting a data reading circuit is constituted by four memory cells MS1 to MS4 connected electrically in series, four FETs S1 to S4 connected in parallel with the memory cells MS1 to MS4 in one-to-one correspondence, and an FET S0 connected to one of series connection ends of the memory cells MS1 to MS4. Each memory cell MS1-MS4 is formed out of a TMR element having two TMR element portions connected electrically in series. The two TMR element portions are connected in series to thereby form a series connection body. A sensing current flows in only through one end of the series connection body of the two TMR element portions, passes through the TMR element portions in turn, and then flows out only through the other end of the series connection body.

Further, the TMR element 11 has two TMR element portions 11A and 11B. The TMR element portions 11A and 11B are disposed in a direction parallel with their laminated surfaces with respect to each other. The TMR element portions 11A and 11B are electrically connected in series to thereby form a series connection body. A sensing current for detecting a change in magnetoresistance flows in only through one end of the series connection body of the two TMR element portions 11A and 11B, passes through the TMR element portions 11A and 11B in turn, and then flows out only through the other end of the series connection body. The sensing current flows through an effective area effective in changing the magnetoresistance in each TMR element portion 11A, 11B, and in a direction substantially perpendicular to the laminated surface.